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| 10/524,781 | 02/16/2005 | Uwe Pauluhn | 2001P19538WOUS | 8705 |

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| EXAMINER | |
|---|---|
| ELPENORD, CANDAL | |

| ART UNIT | PAPER NUMBER |
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| 2416 | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/524,781 | PAULUHN ET AL. | |
| | Examiner | Art Unit | |
| | CANDAL ELPENORD | 2416 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *01 December 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *7-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *February 16, 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *February 16, 2005, April 17, 2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 01, 2008 has been entered.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. **Claim 7** is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al (US 2002/0060985 A1) in view of Stern et al (US 2003/0169692 A1).

**Regarding claim 7**, Lee '985 discloses a method for managing resources ("controlling a traffic stream to flow in reverse direction when link failure occurs", recited in paragraph 0021, lines 1-9) when establishing a substitute path ("backup path", recited in paragraph 0031, lines 1-9 and fig. 3, Backup LSP) from a source node (fig. 3, LSR1 Ingress) to a terminal node (fig. 3, LSR8 Egress) in a transparently switchable network (fig. 3 and fig. 4, MPLS network, recited in paragraph 0020, lines 1-5) for signal transmission ("fault indication signal", recited in paragraph 0041, lines 1-6), wherein the source node (fig. 3, LSR1 Ingress) and the terminal node (fig. 3, LSR8 Ingress) are connected to a plurality of network nodes (fig. 3 and 4, "nodes LSR5, LSR7, LSR2, LSR10 and LSR12") having interposed link sections (fig. 3, 4 and 5, "plurality of links-LSR4-LSR3 and LSR3-LSR10", recited in paragraph 0039, lines 1-5) the method ("controlling a traffic stream to flow in reverse direction when link failure occurs", recited in paragraph 0021, lines 1-9) comprising: providing switching devices in the network nodes (fig. 4, see LSR2,LSR5, LSR7 as the MPLS nodes with switches), in the source

nodes (fig. 4, Ingress LSR1, LSR9 and LSR11), and in the terminal nodes (fig. 4, LSR8) for switching a plurality of paths (fig.4 and fig. 5, "protected Point-to-Point LSP and loopback path) for signal transmission between the source node (fig. 3, LSR1 Ingress) and the terminal node (fig. 3, LSR8 Egress); utilizing a first network resource (fig. 5, LSR2 and LSR10 and LSR12 as the network nodes controlled by the source nodes) controlled by the source node (fig. 5, Ingress LSR1, Ingress LSR9 and Ingress LSR11) for the signal transmission and for switching of the link sections (fig. 5, within one of the paths (fig. 5, protected point-to-point LSP, and Loopback path "plurality of links-LSR4-LSR3 and LSR3-LSR10", recited in paragraph 0039, lines 1-5), generating an error message ("transferred of fault indication signal message to indicate a route does not exist", paragraph 0041) wherein the signal transmission is interrupted upon occurrence of an imperfection ("sensing failure occurring in the link", recited in paragraph 0033, lines 1-7) in at least one of the one path ("failure in link", recited in paragraph 0022, lines 9-10) and a network node (fig. 5, Node LSR2),and transmitting the error message ("transferred of fault indication signal message to indicate a route does not exist", paragraph 0041) is transmitted from the network node (fig. 3, LSR3, recited in paragraph 0041, lines 1-6) to the source node (fig. 3, Ingress LSR, recited in paragraph 0041,lines 1-6), the network node (fig. 4, LSR6 sensing failure and stream transfers upstream to LSR4", recited in paragraph 0033-0034) arranged upstream of the imperfection ("link failure", recited in paragraph 0034, lines 1-7) relative to a signal transmission direction ("path of an upstream", recited in paragraph 0015, lines 3-12) determining, upon receipt of the error message ("receiving fault indication signal and

switching of traffic stream to a backup label switched path", recited in paragraph 0017, lines 1-9) by the source node a substitute path (fig. 4, "loop-backs in reverse direction", recited in paragraph 0036, lines 1-8-flow of traffic in reverse direction after link failure) for rerouting the signal transmission ("loopbacking of traffic stream in reverse direction" , recited in paragraph 0022, lines 1-10) around the imperfection ("sensing failure and fast rerouting", recited in paragraph 0040, lines 1-8 ) using a control signal ("control signal and fault indication signal", recited in paragraph 0040, lines 1-8) generated by the source node (fig. 4, LSR3 which detects the failure in the link, recited in paragraph 0040-0041).

Lee '985 discloses all the claimed limitations with the exception of being silent with respect to claimed features:

**Regarding claim 7**, determining, upon receipt of the error message, by the source node a substitute path for rerouting the signal transmission around the imperfection, according to a second resource to be established, using a control signal generated by the source node; and establishing at the second resource for switching the link sections of the substitute path such that only such link sections disposed in the rerouting and in need of reswitching are newly switched by the network nodes included in the rerouting, wherein the second resource is established using the control signal and the first resource, and wherein switched link sections common to the path and the substitute path are maintained.

However, Stern '692 from the same field of endeavor discloses the above claimed features:

**Regarding claim 7**, determining, upon receipt of the error message (see, exchange of fault information and then using the fault information (i.e. path or link or route failure) for executing a fault restoration around the failed link, paragraph 0012, lines 17-24), by the source node a substitute path for rerouting the signal transmission around the imperfection (see, detouring (i.e. rerouting to alternate paths) of the communication affected by the fault using restoration paths, paragraphs 0013, 0021, fig. 2, fig. 5, see detouring around the failed link), according to a second resource to be established (see, the restoration path in the event of failure as shown in fig. 2, node 210, paragraphs 0055-0056), using a control signal generated by the source node (see, multicasting of a restoration message to other nodes in order to execute a path restoration, paragraph 0078); and establishing at the second resource for switching the link sections of the substitute path such that only such link sections disposed in the rerouting and in need of reswitching are newly switched by the network nodes included in the rerouting (see, reconfiguration of the cross-connections after receiving confirmation and messages and returning of the traffic to its restored working path after a fault is repaired, paragraphs 0078, 0082-0084) wherein the second resource is established using the control signal and the first resource, and wherein switched link sections common to the path and the substitute path are maintained (see, return of the restored traffic to it working path after fault is repaired, paragraphs 0083-0084).

In view of the above, having the method for high speed rerouting in an MPLS network of Lee '985, and system and method for the restoration of communications in a communication network upon detection of fault of Stern '692, it would have been

obvious to one of ordinary skill in the art at the time the invention was made to modify the teaching features of Lee '895 by using features as taught by Stern '692 in order to provide restoration after the failure on the link (i.e. path or node) has been repaired as suggested in paragraphs 0083-0084.

6. **Claims 8-14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al (US 2002/0060985 A1) in view of Stern et al (US 2003/0169692 A1) as applied to claim 7, and further view of Nathan et al (US 6,052,210).

**Regarding claim 8**, Lee '985 discloses the method ("controlling a traffic stream to flow in reverse direction when link failure occurs", recited in paragraph 0021, lines 1-9), wherein the maintained switched link sections commonly assigned to the original path (fig. 3, 4 and 5, "plurality of links-LSR4-LSR3 and LSR3-LSR10", recited in paragraph 0039, lines 1-5) and to the substitute path (fig. 5, Loopback path, "LSR6-LSR4, LSR4-LSR3 and LSR14-15) and the necessary switching of the link sections of the rerouting (fig. 4 and fig. 5,loopback traffic flow after failure, paragraph 0040, lines 1-8).

**Regarding claims 11-14**, Lee '985 discloses the method ("controlling a traffic stream to flow in reverse direction when link failure occurs", recited in paragraph 0021, lines 1-9), wherein, when there is a plurality of imperfections in the path (fig. 5, "failures in the plurality of links", recited in paragraph 0038, lines 1-3), firstly the imperfection (fig. 5, "failure in link LSR2-LSR3) nearest to the source node (fig. 5, LSR3 or LSR2) is rerouted around with a first substitute path (fig. 5, Loopbacked to ingress LSR9 after

failure", recited in paragraph 0038-0039) and thereafter the other imperfections (fig. 5, "failures in the plurality of links", recited in paragraph 0038, lines 1-3) in succession upstream are rerouted around with further substitute paths (fig. 5 multiple loopbacked paths after failure" recited in paragraph 0039-41).

Lee '985 and Stern '692 disclose all the claimed limitations with the exception of being silent with respect to the following features:

**Regarding claim 8**, the release of the link sections from the original path no longer used in the substitute path are controlled by setting up the second resource from an updating of the first resource at the respective nodes.

**Regarding claims 9-10**, the method, wherein the link sections disposed in the rerouting are switched with a minimum number of new switchings by the network nodes.

**Regarding claims 11-14**, wherein the resource of one of the substitute paths to be established is updated from the previous established resource of the path or substitute path, and wherein switchings of identically used link sections between the original path and the respective substitute paths are maintained.

However, Nathan '210 from the same field of endeavor discloses the above claimed features:

**Regarding claim 8**, the release ("decoupling of port upon failure and the link sections", recited in col. 7, lines 4-34) of the link sections from the original path ("upon detection of failure, the optical network nodes finds alternate path", recited in col. 8, lines 13-32-the links section in the original are not used) no longer used in the substitute pat (fig. 1A, Alternate links/paths 152, 150, 154, recited in col. 3, lines 54-67 and col. 4,

lines 1-11) are controlled by setting up the second resource (fig. 1, Spare Fibers, recited in col. 8, lines 13-20) from an updating ("transition from failure mode to normal operation", recited in col. 7, lines 35-46 and col. 7, lines 1-34 and 46-59 and fig. 3, Event 304 and Action 306) of the first resource (fig. 1A, Optical Cross Connect 104, recited in col. 3, lines 62-67) at the respective nodes (fig. 1A, Ring nodes 112-120, recited in col. 54-61).

**Regarding claim 9**, the method ("routing/carrying data traffic to an alternate path in reverse direction during ring nodes' failure", recited in col. 3-4, lines 59-67 and lines 1-34) wherein the link sections disposed (fig. 1A-1B, "primary links/paths 156,136,144", recited in col. 3, lines 12-24) in the rerouting ("transfer of data in the reverse direction using the spare path", recited in col. 3, lines 35-50) are switched (after the failed link has been repaired, the optical controller of ring node transition to normal of operation with minimal switching, recited in col. 7, lines 35-46) in with a minimum number of new switchings ("switching commands", recited in col. 5, lines 32-47) by the network nodes (fig. 4A, fig. 4B, "coupling and decoupling of optical network ring nodes from failed link mode to normal mode of operation", recited in col. 6-7, lines 35 and lines 1-45).

**Regarding claim10**, the method ("routing/carrying data traffic to an alternate path in reverse direction during ring nodes' failure", recited in col. 3-4, lines 59-67 and lines 1-34), wherein the link sections disposed (fig. 1A-1B, "primary links/paths 156,136,144", recited in col. 3, lines 12-24-the primary paths are the links that are bypassed due failure) in the rerouting ("transfer of data in the reverse direction using the spare path", recited in col. 3, lines 35-50) are switched (after the failed link has been

repaired, the optical controller of ring node transition to normal of operation with minimal switching, recited in col. 7, lines 35-46) with a minimum number of new switchings ("switching commands", recited in col. 5, lines 32-47) by the network nodes (fig. 4A, fig. 4B, "coupling and decoupling of optical network ring nodes from failed link mode to normal mode of operation", recited in col. 6-7, lines 35 and lines 1-45).

**Regarding claim 11-14**, wherein the resource (fig. 1A, "plurality of Optical ring nodes 112, 120, 116 and 122) of one of the substitute paths (fig. 1A, Alternate links/paths 152, 150, 154, recited in col. 3, lines 54-67 and col. 4, lines 1-11) to be established is updated ("transition from failure mode to normal operation", recited in col. 7, lines 35-46 and col. 7, lines 1-34 and 46-59 and fig. 3, Event 304 and Action 306) from the previous established resource of the path ("detection of failure and routing traffic to an alternate path", recited in or substitute path, and wherein switchings of identically used link sections between the original path and the respective substitute paths are maintained ("transition back to normal mode of operation after the failed links are repaired", recited in col. 2, lines 21-37-imply that links between the original and alternate are maintained).

In view of the above, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the features of Lee '985 with Stern '692 by using features as taught by Nathan '210 in order to withstand multiple link failures and to provide self-healing in the network nodes as suggested in col. 1-2, lines 54-67 and lines 1-13.

7. **Claims 15-22** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al (US 2002/0060985 A1) in view of Stern et al (US 2003/0169692 A1), Nathan et al (US 6,052,210) as applied to claims 8-14 and further view of Flanagan et al (US 5,933,258).

Lee '985, Stern '692 and Nathan '210 disclose all the claimed limitations of the with the exception of being silent with respect to claimed features:

**Regarding claims 15**, wherein at each network node switching between channels is carried out for the transmission of signals with differing granularities.

However, Flanagan '258 from the same field of endeavor discloses the above claimed features: the method ("protecting a plurality of bidirectional optical communication links in the event of a fault on the working channel", recited in col. 3, lines 37-50), wherein at each network node ("optical port", recited in col. 3, lines 22-33) switching between channels ("optical channel", recited in col. 3, lines 22-33) is carried out for the transmission of signals ("receiving of optical signals", recited in col. 3, lines 22-33) with differing granularities ("receiving and transmitting of optical signals with a first and second wavelengths", recited in col. 3, lines 22-33).

In view of the above, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the features of Lee '985 with Stern '692, Nathan '210 by using features as taught by Flanagan '258 in order to provide protection and to control optical switches as suggested in col. 2, lines 21-61 for motivation.

Regarding claims 16-22, please see the Examiner comments with respect to claim 15 as discussed above.

***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Huang et al (US 6,308,282 B1) and Chaudhuri et al (US 6,324,162 B1).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CANDAL ELPENORD whose telephone number is (571)270-3123. The examiner can normally be reached on Monday through Friday 7:30AM to 5:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang Bin Yao can be reached on (571) 272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Candal Elpenord/

Examiner, Art Unit 2416

/Kwang B. Yao/
Supervisory Patent Examiner, Art Unit 2416